

# COMPUTERWORLD

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## Students Demolish Computer Center



Punched cards, printouts, and computer tapes litter the street after the student riot. Students, fearful that their scholastic year may be endangered by the loss of university records, leaf through the debris in hopes of finding their records. (World Wide Photo)

## USASI Decides Revised Fortran Standard Must Be Able to Run Existing Programs

NEW YORK — Fortran programs which conform to the present Fortran standard are to be protected when the next set of Fortran standards is prepared, it was decided by the USASI Fortran Working Group at a recent meeting.

This means that a user can now feel assured of the continued usefulness of his Fortran programs. The U.S. government and other large users will almost certainly insist that compilers de-

livered by manufacturers conform to the USASI standard and that therefore they be able to run existing programs for at least the next six or seven years.

### Fortran Being Reviewed

The decision that the new Fortran standard should maintain the integrity of existing user programs came when the working committee decided that it was time to start revising the Fortran standard adopted in

1966. Under USASI regulations, all standards have to be reviewed every five years or more frequently if necessary.

### Suggestions Welcomed

As a part of the review, the committee would like to receive inquiries and suggestions on new items to be included in the new Fortran. Suggestions or inquiries may be sent to X3 Secretary, Bema, 235 East 42nd St., New York, N.Y.

## Illinois Is Considering an Antitrust Suit Against IBM, Attorney General Says

By a CW Staff Writer

CHICAGO — A new possibility of antitrust action against IBM, which might involve triple damages for hundreds of IBM computer installations, was revealed here last week by Illinois Attorney General William J. Scott.

"We are taking a hard look at the area of computer equipment," Scott told newsmen at a conference widely reported

The suit, if it comes, is expected to be a class action, which would mean that in addition to the 40 or so state computers all the IBM computers at municipalities, universities, etc. in the state also would be covered.

During the past few years antitrust actions have become very live issues in Illinois. Last week the state received an offer of at least \$3 million to settle a drug

antitrust case. Other successful cases have included metal library shelving, portable bleachers for schools, and rock salt.

A number of the smaller municipalities which have received shares of the damages have found that the money considerably helped their financial position. As a result, there is political pressure in favor of strict enforcement of the federal and state antitrust statutes.

## Computers Axed, Installation Fired, Cards, Printouts Throw in Street

By Peter L. Briggs

CW Staff Writer

MONTREAL, Quebec — Students destroyed two computers with axes, set fire to the computer center, and threw tapes, punched cards, and printouts into the street during a riot at Sir George Williams University here this month.

A university official said it would take about three months to replace the hardware and at least eight months to bring all the files and software back up to date.

### Principal Files Backed Up

But the university had had the foresight to store backup masters of the payroll files, transcripts, and other critical tape files in remote locations away from the computer center.

"This will enable us to regain most of our necessary information without significant file recreation," said Graham Martin, director of the computer center.

Although the fire didn't reach the tape library, water damage to the library was extensive, Martin said. But he thought that, when everything dried out, much of the data could be recovered.

### Center a Total Loss

But the insurance company that carried the policy on the computer center has "completely written the installation off as a loss," Martin told Computerworld. This included a Control Data 3300, an IBM 1620, the peripherals, and all related equipment located in the computer room. Hardware damage was estimated at \$1.6 million.

As soon as the new computer arrives, the university will be able to resume fairly normal

operations, Martin said. In the meantime, records and files will have to be updated manually, he said.

### Protest Over 'Racism'

The students, who had held control of the ninth floor of the administration building for two weeks, began to riot in protest over the makeup of a faculty committee named to hear charges of racism against a biology professor.

Police, called after the students ransacked a cafeteria and turned on fire hoses in the new \$26 million Henry F. Hall building, were pelted with pieces of furniture, computer tapes and electrical parts, university records, registration cards, transcripts, and typewriters.

The students destroyed the computers with axes and then started the fire, according to Acting Principal Douglass Clarke.

### 90 Arrested

The riot principally involved the 200 students who had occupied the ninth floor, police said, but there were also scuffles with the 2000 students gathered outside the building. The battle lasted for about 10 hours Feb. 11.

During the riot, 90 persons were arrested and ordered held without bail. The charges against

(Continued on Page 4)

## Standard Cobol Manual Offered For \$2.25/Copy

WASHINGTON, D.C. — Although the official standard manual from the U.S.A. Standards Institute is still unavailable, the Government Printing Office has available "Fundamentals of COBOL-Programmers Reference," manual, which is based on the Standard.

The new manual, issued last week, costs \$2.25 and includes a description of the modules and levels associated with the standard.

It includes sample problems and provides descriptions of how Cobol programs are organized, generally and in detail.

The manual is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20350 under the number NAVSO P-3063.

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# Million-Byte Remote-Batch System May Cut Costs 50%

WASHINGTON, D.C. — A time-sharing service which emphasizes the economy of not using time-sharing computations is claiming a technological breakthrough.

U.S. Time-Sharing, which was formed late in 1967 and started limited data center operations in 1968, will install next month a one million byte system 360/65.

This system will provide time-sharing operations for a user so that he can set up his programming to run the actual program without time-sharing.

W. Porter Stone, the president of U.S. Time-Sharing, told *Computerworld* last week that he believed this performance would be very economical for people with large computations.

U.S. Time-Sharing expects, he said, to be able to knock the price of computations by approximately 50%.

## OS 360 Only

Specifically, the system will run OS360 programs only. From his terminal the user will be able to set up his tapes, prepare his files, and give operating instructions as necessary.

The system will then be set up into a job queue. After waiting his turn in the queue the user will then receive the full power of the computer without any overhead due to the operating system.

## Why Not Model 67

Dr. Jack Stone, technical director of the company, explained that the reason for adopting this approach as opposed to the Model 67 style of approach was to avoid the overhead involved in time-sharing operations.

"The Model 67 is simply a Model 65 which has some additional circuits added to it for performing dynamic address translation," Dr. Stone said. This circuitry allows a program to operate as if the core memory of the computer were unlimited in size.

"The problem with this approach," says Dr. Stone, "is that most programs which use a great deal of core memory use it because the program requires immediate access to the memory locations being referenced."

"In the Model 67, with its virtual memory approach, the

address locations may actually be stored on disk.

"The result is a considerable reduction in efficiency in this approach to time-sharing as contrasted with batch processing."

## Different Market

Porter Stone explained that the market U.S. Time-Sharing was headed for was different from the one he believed most time-sharing systems are aimed at.

"We are aiming at the people who have \$3,000 computations to do rather than \$3.00 ones," he said.

"The \$3.00 client isn't really worried if he gets a reduction of a dollar. He can afford to pay \$3.00 for his conversational type use. But the users who use a lot of central processing time can't afford to pay for unnecessary overheads and we have set up our services so they do not do so."

## H-200, 1410, 1401's FOR SALE

IPS has several small- and medium-size IBM and Honeywell systems for sale and delivery in the near future. A H-200 8K system with 3 20KC tapes is available now. IBM 1410's available include an 80K with 2302 disc and 7330 tapes, and a 40K with 1402, 1403, and 9 7330's. Among the 1401's (all with 1402, 1403) are an 8K and 4K card system, and a 4K with 2 1311's. A 1440 8K 2-1311 and a 1440 16K 3-1311 system are also available. For prices, delivery, and details, please call or write.



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# ANNOUNCING A FOUR-DAY SEMINAR IN ADVANCED SYSTEMS/PROGRAMMING DESIGN CONCEPTS

An international computer-oriented management consulting and software development firm, MANAGEMENT SCIENCE AMERICA, INC., specialists in solving the scientific problems of management, is offering a four-day seminar entitled ADVANCED SYSTEMS/PROGRAMMING DESIGN CONCEPTS.

## SEMINAR OBJECTIVES

The purpose of this four-day seminar is to provide systems and programming personnel with the necessary tools to design and implement business data processing systems. An additional highlight of the session is the concept of project management through the use of network scheduling techniques.

## SEMINAR TOPICS

### \* Analysis

The Survey  
Systems Investigation  
Project Management  
Workshop

### \* Program Design

General Concepts  
Structure Theory  
Module Development and Communication Devices  
Standardization of Modules  
Types of Programs  
Development of Module  
Development Chart  
Documentation Benchmarks

### \* Systems Design

General Concepts  
Systems Documentation Benchmarks  
Report Design Standards  
Input Considerations  
Organization of the Data Base and Support Programs  
Turnover to Programming

### \* Implementation

Development of the Procedures Manual  
User Education on the New System  
Program Testing  
Creating the Data Base  
Systems Testing  
Systems Paralleling and Refinement

### \* Advanced Concepts

Data Center Concepts  
Impact of Application Software  
Advanced Data Base Structures  
Multi-Level Storage Techniques  
Tele-Processing

## SEMINAR METHODS

This highly professional Advanced Systems/Programming Design Concepts Seminar will consist of lecture, discussion, and case study. Workshop sessions and real-life problems will be emphasized throughout the course. Previous seminars of this subject have received an enthusiastic response in that they reflect a true "hands-on" approach to this common problem.

## PARTICIPANTS

Those who will be most interested and will benefit most from attending this seminar will be data processing and systems managers, systems analysts, programmers, and personnel involved in the standards and documentation of computer systems.

## LOCATION OF SEMINAR AND FEE

Members of MSA's professional consulting staff will conduct the session March 17-20 in San Francisco, California. The registration fee of \$150 per person includes all course material, coffee breaks, and lunches. This fee does NOT include lodging.

## OTHER PROFESSIONAL SEMINARS OFFERED BY MSA

Additional sessions will be conducted throughout the year in major metropolitan areas. Seminar topics include:

- ★ Textile Production Scheduling Systems
- ★ Apparel Forecasting and Production Scheduling Techniques
- ★ Textile Cost Systems
- ★ Management Information and Control Systems
- ★ Furniture Management Information Systems

### REGISTRATION FORM

Please register me for the seminar in ADVANCED SYSTEMS/PROGRAMMING DESIGN CONCEPTS to be conducted March 17-20 in San Francisco, California. Please arrange motel accommodations for my arrival on \_\_\_\_\_.

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Fee: \$150 per person. Please make check payable to and mail to:

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Attn.: Seminar Registrar

I do not wish to register at this time, however, please send me additional information about this and future MSA seminars.

## DATA COMMUNICATION IDEAS?

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## Standard Computer

Standard Computer Corporation, 1411 West Olympic Boulevard, Los Angeles, California 90015 (213) 387-5267



The computer terminals, lower right, on the exchange floor were hit by the force of the explosion in the visitors' gallery, upper right, and then showered by debris. (World Wide Photo)

## Stock Exchange Bombing Cripples Computer System

By a CW Staff Writer

MONTREAL, Quebec — A bomb exploded at the stock exchange here Feb. 13, injuring 27 persons and crippling the computer-based reporting system for an estimated six to eight weeks.

The blast shortly before the close of trading at the combined Montreal and Canadian Stock Exchanges forced the exchange to return to its old manual system when it reopened the following day.

About 300 persons were in the exchange when the bomb exploded in the visitors' gallery. The exchange floor was hit by the blast and showered by debris from the gallery and the ceiling. The exchange, forced to close after the explosion, was able to reopen about an hour late the next morning.

### Computer Terminals Ruined

The major problem was created when the price-quotation and bid-reporting terminals were damaged. Two were destroyed. This meant that when trading reopened, all information had to be recorded on blackboards by "chalk boys" as had been done many years ago.

The exchange, located in the

Place Victoria skyscraper in the center of the financial district, suffered extensive damage. "Normal operations will not resume for six to eight weeks," according to Charles Neapole, president of the combined Montreal and Canadian exchanges.

### Central Computer Undamaged

Although the central computer appeared to be undamaged, the method of entering information into the system had been eliminated.

Twenty-seven persons were slightly injured in the explosion, which police estimate was made up of two to six sticks of dynamite attached to a timing mechanism. Damage was estimated at \$500,000.

The small number of injuries was "almost a miracle," one witness said.

The blast, the eighth in Montreal since the beginning of the year, has been attributed to the Quebec separationist groups. The previous attacks were aimed at military and financial areas.

Police officials admitted that there was little which could be done to prevent such occurrences in the future even though extensive controls on the sale of explosives is exercised.

# Registration Would Protect Programs But Not Concepts

WASHINGTON, D.C. — IBM has suggested that special laws to protect computer programs should be passed which would carry penalties for unauthorized use or possession of registered programs but which would allow anyone to make use of the fundamental concepts included in the program.

The company's suggestions, made to the Patent Office, have been placed in a secret file there along with other suggestions on

how protection for computer programs can be provided. The Patent Office refused to say why the file was being kept secret or to indicate when its contents would be made available for general discussion.

The IBM report proposes a registration system which provides protection for the investment involved in creating a workable program rather than for the discovery of new concepts or new principles. Under

the proposed system a registered program could not be copied, executed, translated, etc., without the owner's authorization.

### How It Works

At the time of registration a copy of the program *per se* and a description of the concepts used in the program would be deposited with a registrar. At the option of the party registering a program, a detailed description of the program (e.g., detailed flowcharts, etc.) could also be deposited if one wants to gain protection for this material. The registrar would maintain the program *per se* and the detailed description in secrecy until the end of the period of protection, but he would make public the description of the concepts. The person who registers a program could attempt to keep the registered program secret or he could divulge the program to any extent that he desires. The only examination required at the time of registration would be a determination that the format of the description of the concepts is in proper form.

### Forbidden Behavior

Unauthorized copying, translation, use, or transfer of physical possession of a registered program or of the registered detailed description would subject one to liability. No liability would be incurred under this system by one who uses the published conceptual description to independently create a new program.

### No Change in Patent

IBM says that the proposal does not involve any changes in the patent system. Thus, the patent system would continue to exist in its present form. If someone believes he has developed a patentable concept he may seek patent protection for that concept. He could, if he desired, also register the detailed program, providing he disclosed the concept for which patent protection had been requested.



The door to the captured university computer center is barricaded by broken furniture, computer equipment, and files. The photo was taken while the students were still inside. (World Wide Photo)

## Students Wreck Computer Center

(Continued from Page 1)

some of them could bring sentences of from five years to life imprisonment.

After the riot, hundreds of

undergraduates assisted in cleaning up and restoring the damaged facilities. The estimate of total damage was upwards of \$2 million.

Please Circle 1 Number and 1 Letter:

### YOUR TITLE AND/OR FUNCTION?

- A. Operational Management (nonengineering)
- B. Computer Professional Staff
- C. Corporate Officers
- D. Engineering Management
- E. Engineering/Scientific
- F. Production/Maintenance
- G. Sales/Marketing
- H. Other \_\_\_\_\_

### COMPANY BUSINESS:

- 1. Mining or Construction
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- 3. Manufacturer/Other
- 4. Utility
- 5. Wholesale/Retail
- 6. Finance
- 7. Consultants/DP Services
- 8. Business Service (except DP)
- 9. Educational/Medical/Legal
- 10. Government/Military
- 11. Other \_\_\_\_\_

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# Course Provides Opportunity To Open Black DP Businesses

NEW YORK — A course on "How To Start and Operate a Data Processing Business" featuring the presidents and senior officers of eight of New York's most successful companies is being offered free for members of the black business community in March.

Sponsored by the Interracial Council For Business Opportunity and ADAPSO, the service bureau trade association course is restricted to people who have experience in data processing.

#### Financing Included

The topics will include ways to finance data processing businesses, the opportunities offered by time-sharing, software, data centers, marketing problems involved, and operational methods.

The industry representatives are: Richard Guibert, vice-president, Statistics for Management, Inc.; Sal Parisi, president, Tabulating & Data Processing Corp.; Bernard Goldstein, president, United Data Processing, Inc.; Robert Feuerzeig, director, corporate development, Programming Sciences, Inc.; Andrew Thrash, president, and Robert Johnson, vice-president, Data Transformation, Inc.; and Charles Bartlett, account executive, Databab, Inc. Joel Dorfman, vice-president, Integrated Computer Services, Inc., is the seminar coordinator.

This marks the first time that the ICBO either in New York or in any of its other council cities — Newark, N.J., Washington, D.C., Los Angeles, and New Orleans — has run a seminar in data processing.

#### Recognized Black Need

The ICBO recognizes there is a source of experienced manage-

ment, professional and skilled technicians among blacks within the data processing field. Many, it is felt, have the potential, interest, and experience to start their own business.

For further information on the seminar and for registration call Miss Maudra Jones, associate director, ICBO of New York, 110 E. 23rd St., New York 10010.

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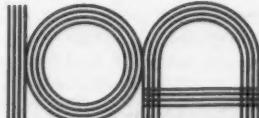
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**IBM 1401 Model E5, 4K, Exp. Print Edit., Adv. Progmg., Add. Print Control, Sense Switches, 1402 Model 1, Early Card Read, 1403-2 Printer.**

**IBM 1410 — 40K System, 1411-3 Dual Synch. Adptr, I/O Adptr, Priority Feature, Processing Overlap, Tape I/O Adptr, Channel 1, Tape I/O Adptr, Channel 2, Two-1414-02 (for 7330 Tapes), 1415-1 Console.**

**IBM 1401 Model C4, 8K, Exp. Print Edit., Addl. Print Control, Sense Switches, Read Punch Release, Adv. Progmg., 800 psi Feature, Hi-Lo-Eq. Compare, Multiply-Divide, Serial I/O Adptr, 1402-1 Card Reader/Punch, 1403-2 Printer.**

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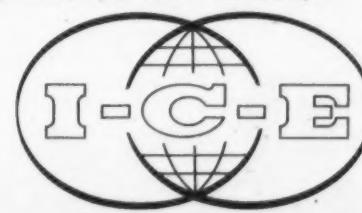
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## S/360-Compatible Audio Response Unit Has 255 Word Vocabulary

PENNSAUKEN, N.J. — A computer-controlled voice response system with the capacity for 256 data channels and up to 255 words of vocabulary has been announced by Technitrend.

The unit handles any language including letters and numbers on a single prerecorded voice drum memory. Each track on the drum may contain either three identical 0.6-second words or a 1.8-second sentence.

### S/360 Compatible

The unit is compatible with the IBM S/360 under the Basic Telecommunications Access Method, but the interface can be modified to fit any computer, the company maintains.

### Touch-tone Data Entry

Information is entered into the system through any touch-tone compatible data entry device such as the telephone, the company stated. The information is transmitted over normal direct-dial telephone lines, and interfaced through the Bell 403A, 403D, or 401J3 Data Sets.

The unit, called the VM-1400, processes the I/O data flow and responds to each incoming channel with digital output. The digital information is transformed into vocabulary and put out

### New Products

over the inquiring channel.

Remote coupling of the device can be accomplished through the well-tested frequency division multiplexing technique, the company added.

### Investment and Real Estate

Applications to which the device is especially suited are considered to be investment analysis, general information retrieval, real estate systems, inventory control, credit verification, security quotations, and travel reservation systems, the company said.

The device, already installed in the Realtron system in Detroit, is available in the price range of \$30,000 to \$110,000 for local installations, according to Richard Jenik, director of marketing for the company.

For further information contact: Technitrend, Inc., 7300 N. Crescent Blvd., Pennsauken, N.J. 08110.

### Disk File System

A new file system consisting of M2500 disk drives and DC10

control unit has been designed to interface with a Digital Equipment Corp.'s PDP-10 computer. The storage medium is standard interchangeable disk packs.

Software is provided for

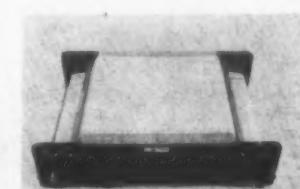


operation on a PDP-10 processor. The system is reported to be adaptable to other small and medium size computers. Field service manuals, operating manuals and all supporting documentation are provided.

Prices start at \$41,500 and are available on 90-day delivery with service contracts and lease agreements. Interactive Computing Corp., 500 S. Main St., Orange, Calif. 92668 or Marshall

Laboratories, 2426 Amsler St., Torrance Calif. 90505.

### Strip Chart Viewer



A new chart viewer has been designed for analyzing data on strip charts. Side frames are of extruded aluminum with black anodize finish. The platen under the strip chart is of stainless steel to prevent chart damage.

A hand crank is used for passage of the chart while reading proceeds. A translucent platen and fluorescent back lighting are optional. Royson Engineering Co., Hatboro, Pa. 19040.

### Microfiche System



A new system for storage and retrieval of microfiche, aperture, and data tab cards consists of an easel type three-ring binder with die cut sheets of acid free paper.

The binder is covered with heavy vinyl and has standard one-inch rings to accept metal reinforced sheets die cut for 30 microfiche or 32 aperture or tab cards. Boorum & Pease, 84 Hudson Ave., Brooklyn, N.Y. 11201.

### Check Digit Calculator



A new calculator, the PCA Check Digit, determines check digits for numbers up to nine digits long. It is of circular construction, 12" x 9".

When each digit within a number is selected by pencil point and advanced to the next "stop" position, the check digit appears in a window. Standard modules are available for numbers up to nine digits long. Prices start at \$31.75 each. Distributed in the U.S. by Jay Smith, Inc., 292 E. State St., Westport, Conn. 06880, for Punched Card Associates, Ltd., England.

### Remote Entry Keyboard

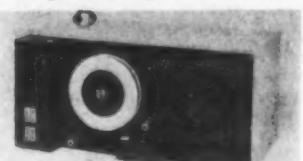


A new keyboard device, the Model 33 "Secretarial Terminal," operates into a Bell

System Data Set 402C. The keyboard is fully buffered with an 8-bit ASCII code output including a full set of upper and lower case alphabets, numerics, and control codes.

Eleven special function codes are optional. DataNetics Corp., 2828 Spreckels Lane, Redondo Beach, Calif. 90278.

### Magnetic Tape Transport



A new digital magnetic tape transport, the PEC 7820, priced at \$2750, has been designed for small digital computer and data communication terminal applications and is IBM compatible.

The unit employs a simple single-capstan velocity-servo system which eliminates the pinch roller. Seven-inch reels store 600 feet of magnetic tape. Delivery will begin in early 1969. Peripheral Equipment Corp., 9551 Irondale Ave., Chatsworth, Calif. 91311.

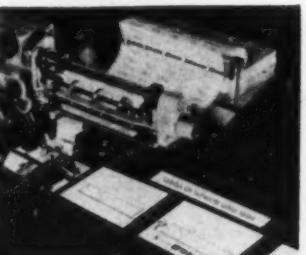
### Data Collection System



A new data collection system, Message Composer, is a simplified slide operated keyboard that will transmit information from the point of origin to the data processing center. The system is designed to supplement and extend the key punching function.

The input panel has 20 slides with 20 windows where the position of the slides may be ascertained visually, and an overlay to organize the particular task in the language of the job. Deliveries are from stock. North Electric Co., Electronetics Div., Galion, Ohio 44722.

### Labeling Head Machine



A new labeling head has large heat wheels to apply heat activated labels or transfer descriptions on documents and mail pieces at high speeds.

Mounted on a Cheshire machine base, the new head will label or transfer-imprint on documents from 3-1/4" x 5-1/2" to 14" x 17" and up to half an inch thick. Cheshire, Inc., 408 Washington Blvd., Mundelein Ill. 60060.

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**Editorials****An Excellent Decision**

The action of X3.4.3 in agreeing that future extensions of standard Fortran must not impinge on the use of present-day Fortran programs is excellent. It is necessary and appropriate to have the users' interests put firmly first in these standardization processes. Fortran is in many ways a leader in this area and it can be assumed that in future cases equivalent rulings will be made.

Whether or not the rulings, once made, should actually be adhered to, however, is perhaps open to question. There may be cases in which even the great investment which exists in present-day programs should be sacrificed. We have difficulty in defining such a case — but its potential is always there.

In such a case it will be necessary for the appropriate standards committees both to look carefully at whether or not it is really necessary to break away, and also to define just what the breakaway shall be. After this week's ruling, it is clear that the committees will handle very carefully both these problems.

The guarantee of this action by future committees is the true importance of this week's ruling. It is good, of course, that later standards are kept compatible with earlier standards. It is even more important, however, that the problem of incompatibility of standards, when it does occur, is given unusually detailed attention.

**Undesirable Secrecy**

The action of the Patent Office in putting a seal on the suggestions made to it for the protection of software is incomprehensible. There is nothing proprietary about these suggestions; there are no state secrets involved, and moreover, there is a great public interest. The people in the outside world need to know what other people's suggestions are so that they can consider them and their implications.

*Computerworld* has, of course, moved to have the Commissioner's seal removed from these documents, but this will take time. It should never have been necessary.

Can it be true that the patent office has a bias against computer programs?

**Computer at the Stake**

The burning of a computer in Montreal formed an ironic commentary on our last week's issue. In that issue, in the supplement, we had referred to the fact that sabotage was always possible. At that stage, however, we were not aware of any computers that had actually been destroyed.

Now we are.

This would have been quite unthinkable as recently as two or three years ago. It is simply a symptom of a different social climate in which we all are immersed. *Computerworld* regrets but re-emphasizes its advice that sabotage is a real and growing hazard which you ignore at your peril.

**Point at Issue****Computer Man and Society**

By Robert P. Bigelow

What does the computer industry owe society? *Computerworld* and *Computers and Automation* magazine have raised the question frequently. In the March 1968 issue Ed Berkeley, editor of *Computers and Automation*, reviewed 1967 and found that his columns had included about 70 allusions and discussions of political, social, ethical, legal, and philosophical issues during the year. Berkeley believes that the computer man should see and admit that these questions exist, are important, and deserve some study and attention; he should devote some time weekly to becoming informed on the question; he should discuss this question with friends and associates; and he should take some action to express his moral judgment. The position of *Computerworld* is well known to its readers.

But do computer people really care about social problems?

The Association for Computing Machinery is "dedicated to the responsible use of computers in an increasing diversity of applications." The Association's secretary, Donn Parker, is chairman of its Professional Standards and Practices Committee, which produced the guidelines adopted in November 1966. These guidelines (which apply to all members of ACM) discuss relations with the public, relations with employers and clients, and relations with other professionals.

#### ACM Guidelines

In the first area, relations with the public, the guidelines require the ACM member to have proper regard "for the health, privacy, safety, and general welfare of the public, and to oppose any untrue, inaccurate, or exaggerated statement or claims, to express an opinion on areas within his competence only where founded on adequate knowledge and honest convictions, and to qualify opinions when they are outside his professional area." Partisan statements are to be prefaced by a disclosure of the person for whom they are made.

The Data Processing Management Association apparently set

up a code of ethics when it started out in 1951 (*ACM Communications*, March 1968, p. 198) but I haven't been able to find it. Apparently we now have a new set of ethics for holders of the DPMA Certificate in Data Processing [CW, Aug. 14], but this code is rather wishy-washy on the social duties of the computer professional. The CDP holder "has an obligation . . . to uphold the high ideals . . . certified by the certificate" and "must not engage in

Last week *Computerworld* reported that the ACM has been unable to find any ACM members who are interested in the Special Interest Committee on the Social Implications of Computers.

Robert Bigelow, an ACM member and contributor to *Datamation* and other papers, has, in fact, written on this topic. Here is one of his articles "Computers, Man and Society" which appeared in *Computerworld* on Sept. 4, 1968.

It is reprinted in the public interest.

any contact or commit any act which is discreditable to the reputation or integrity of the data processing profession." I guess this means he must be a good boy, but the "ideals" are not stated.

#### Privacy and Computer Men

What does it all add up to? Let us take one issue which has received considerable publicity for the last several years: the data bank and privacy. The computer press has been full of discussions on this interrelationship. The Government Operations Committee of the House of Representatives held hearings in 1966 and 1968. The Senate Judiciary Committee held hearings in 1967 and 1968. The Joint Economic Committee held hearings in 1967. All five of these hearings discussed computer privacy and data banks. How many computer professionals showed up?

Of 30 witnesses who testified at

the five hearings, only four were connected with the computer industry: Paul Armer and Paul Baran of the Rand Corporation, Emanuel Piore of IBM, and Burton Squires of the University of Illinois. These committees received statements from many organizations but none from the computer "professional" organizations.

Last fall I got a letter from a concerned computer man who said, "Programmers are like morticians who speak of themselves as being 'professionals,' but in fact are, for the most part, technicians."

#### The FCC Inquiry

The Federal Communications Commission in the fall of 1966 started an inquiry into the relationship between computers and communications — a very important question of public policy which will vitally affect the future of the computer industry. The question of privacy also was involved in this inquiry. Responses were filed in March 1968. Fifty-eight companies and organizations filed responses in March of 1968. The data processing trade associations, such as Adapsco and Bema, replied as did practically all the major computer companies.

On the privacy question (defined for purposes of the inquiry as security against unauthorized access), the American Banking Association, the American Newspaper Publishers Association, the American Petroleum Institute, Bema, the Electronic Industries Association, IBM, Lockheed, the National Committee for Utilities Radio, the National Retail Merchants Association, RCA Communications, Univac, and the U.S. Independent Telephone Association all said that no government action was required.

But the Bell System, Control Data, GSA, GT&E, the National Association of Manufacturers, and Western Union all said regulation was needed. All that ACM and DPMA could come up with in support of their fine and high sounding professional stan-

(Continued on Page 9)

**A Look at the Facts****Is Ban on 'Nonapproved' Packs a Marketing Ploy?**

By Ned Chapin

CW Contributing Editor

MENLO PARK, Calif. — The "ban" on nonapproved disk packs could be a marketing ploy, a rejoinder by some big holdouts to those disk pack makers that have cut their price sharply. Consider the following points.

As reported previously in *Computerworld* [Feb. 12 and Jan. 27], some big manufacturers have imposed higher maintenance charges or withdrawn warranties on their disk drives used with disk packs that the drive manufacturers have not approved.

This is just a minor inconvenience to most disk users. To placate the drive manufacturer, they will henceforth acquire their new packs from the drive manufacturer.

For his fidelity, the drive manufacturer could in turn wink at the use of nonapproved packs from the user's inventory since these packs are "use-proven," and the manufacturer did not plan to make the ban retroactive.

**Inadequate QC**

The drive manufacturer's complaint is that some disk pack makers do not maintain adequate quality control on their products.

If this complaint were directed specifically at the magnetic coatings — the most critical part

of a disk pack — it would make sense. But instead, it is directed at the physical tolerances — with one exception, one of the easier aspects of the disk pack manufacturer.

For example, proper spacing between disks and above the spindle is a straightforward engineering problem.

But the thickness of the disk is more complicated. Some of the factors are: the thickness of the metal part of the disk, the flatness of the metal part of the disk, the thickness and evenness of the metallic coating and binders, and the nature of the finishing operations.

Variation in these factors cannot fully offset each other; individually each must meet tolerances across nearly the full width of the disk. These are the critical factors; any reputable disk pack maker is going to check them carefully.

**User Check Station**

Any user can establish a "100% receiving inspection" procedure to verify the tolerances himself, and make it a condition of purchase or rental.

To do so, he needs two things: one disk drive that meets specifications for every head (how many disk drive users know the condition of their drives?), and a small "go-no-go" thickness gauge or jig.

By carefully testing each disk with the jig in two or three places around the outer edge, the user can establish that a disk is not too thick (the only likely condition other than dirt and lack of flatness that can damage drive heads).

By recording any nearly identical data in all tracks of all cylinders, and then reading it back, the user can establish by measuring the signal strength

that the disks and their coatings are not too thin, and that each disk has adequate flatness.

It is my observation that all of the disk pack makers once in a while market a pack that a careful user would reject as not conforming sufficiently to specifications.

**Smashing Possibilities**

But the possibility of a disk pack "smashing" [CW, Feb. 12]

*(Continued on Page 19)*

Possibly, it would take out the top head for that disk and each higher disk in the pack, but this condition should be caught by the disk pack maker.

To "smash" all ten heads [CW, Feb. 12] due only to defective

*(Continued on Page 19)*

**Point at Issue****The Computer Man and Our Society**

*(Continued from Page 8)*

dards was a response from ACM which reported that "lectures, seminars, and other similar programs are now being presented in this subject area with increasing frequency," and that "the Association for Computing Machinery hereby offers its assistance to the Federal Communications Commission by providing a resource of technically qualified professionals to serve the needs of the commission at its pleasure in this vital inquiry." DPMA did not even bother to file any kind of a statement.

**Regulation and Management**

Recently Hugh Donahue of Control Data commented that when government administrators

understand a problem, they either accept or reject the proposition, but when they don't, they regulate it. If the computer industry does not want to find itself regulated by Washington, various states, and the local communities, if the computer community does not want regulation unresponsive to the needs of a growing industry, and prefers not to be stifled like the railroads, then there must be much more attention paid to the issues on a national level.

**Little Interest**

The DPMA International Conference was held in Washington in the end of June. Its five day program included two concurrent seminars on the last day which touched upon the problems that have been discussed above. One seminar dealt with professionalism and data processing, the other with legal and legislative developments affecting the data processing community. It's my understanding that of the thousands who came to the conference only about 30 people showed up for each seminar.

Theodore Rich, the international president of DPMA, in his farewell address that day, spoke on "The Data Processor's Responsibilities to Society." Rich said that he had no doubt that "data processing people will be the management of the future. We in this room will be the presidents, the executive vice presidents, and vice presidents of tomorrow."

But where were those future top managers when topics with which top management will have to deal were discussed? Top executives today don't deal with disks and drums. Their concern is with politics, public relations, poverty, and people. Any computer man who aspires to top management must be knowledgeable, and must accept social responsibility.

**Awareness a Duty**

If computer people want to regard themselves as professionals, they have an obligation to the community and to the nation. They have a duty to use their God-given brains for something besides the conversion of bits into bytes.

We are living in the greatest economy the world has ever known, yet many of our brethren are starving. We have, to quote Theodore Rich again, "the tremendous scope of the computer — its ability to reach into

the very heart of the company... or outward, to every man, woman, and child in this nation." It is the data processor, the computer man, who has today the great opportunity to serve our nation. You who would be a professional in the computer community must first be a professional in American citizenship.

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**Letters to the Editor****Full Price Disclosure Shouldn't Harm Manufacturers**

Three cheers for DPF&G. Full disclosure of prices should not plague any company large enough to use a computer effectively.

Study groups for cost analysis are imperative in the formation of data systems that are healthy and viable.

George R. Joseph  
Univ. of Texas at Arlington

**Should 'Communications'  
Be Optional?**

I have just read and filed my January issue of *Communications of the ACM*. Elapsed time — 20 minutes! Ten minutes for the Washington Commentary, ten minutes for the balance. If I were Mr. Titus I would go for wider circulation and more money.

He should syndicate and go in all the DP journals. This leads me to ask a serious question. Should it have been the *Communications*, and not the *Journal*, that was made optional to the ACM membership?

I had a policy statement for the Techniques Section of the CACM, which quoted from the 1968 January issue:

It is preferable that the techniques contributed be factual and in successful usage, rather than speculative or theoretical. One of the major criteria for acceptance and the question one should answer before submitting any material is — 'Can the reader use this tomorrow?'

In light of this, I look at the January issue of CACM and ask myself, "What is here that the working programmer can use?" I do not find much. I don't ask that professionalism be discarded to cater to the lowest class of coder who writes poor programs; I just ask that the full range be served, not just the high-end or specialized groups.

To support this, imagine you are me, with these

specific reactions to the content of the January issue [of *Communications*]:

Computers in Group Theory: A Survey — This should have been in JACM. It probably would have been if the readership had not been cut by the option of subscription.

Object Code Optimization — Pretty good for specialized class of people, compiler builders. Might be better in a SIG publication.

Polynomial Resultants — I had some interest.

Education — OK, except I question the adjective "appropriate" for PL/I; I would prefer an ALGOL 68 PhD.

Algorithms — Appropriate, and I cannot complain, except that they didn't seem to solve commercial problems.

Directed Random Generation of Sentences — Perhaps, but not a burning question to me. I know programmers who do it all the time, as they speak.

Some Criteria for Timesharing System Performance — I thought it peculiar that there was only one reference. Sorry, I'm suspicious of papers for this reason. It is in the Standards Section, but what is the connection? The criteria are given on page 52, unnumbered (although they are numbered in the preceding text) and without meaningful and concise definition. I don't see any standard proposed, either for adherence or comparison.

Washington Commentary — Now here is something important and useful, as I have already noted.

ACM News — OK and proper, not much other way to get it.

Products — It's old hat when I read it here. I get it from *Computerworld*, *Electronic News*, *Dataamation*, and a dozen others.

Calendar — How incomplete can you get?

R.W. Bemer

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Phoenix, Ariz.

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## JCCs Growth To Be Limited To Keep Technical Balance

Paul Armer, President of Afips, told *Computerworld* that as a result of the new constitution, Afips expected to be broadening its activities and representing the profession in ways where "it has been badly needed."

Dr. Armer also said that Afips intended to restrict the growth of the joint computer conferences by reducing the role of computer applications in them in the future. "We want the tool makers rather than the applications," he said and added, "We want to insure that the technical sessions remain strong."

### New Board Established

While discussing the new constitution which was passed recently, Dr. Armer said that

under it the computer conferences will be handled by a separate board, which will concern itself only with conferences. This would release the Afips executive committee and board to handle other work which currently it has not yet had time to do.

### Technical Sessions Stressed

In the computer conference area, he said there are problems because Afips was growing by leaps and bounds. In particular, he emphasized that Afips would insure that technical sessions would remain a strong part of the conferences and would not be overwhelmed by the exhibits.

He recalled other examples, including the IEEE and the Wes-

con shows, which he said have reduced their technical areas to practically nothing.

The Afips technique is to keep the technical sessions strong, he said, by emphasizing the role of the tool makers, both in hardware and in software, and hopefully to restrict the growth of the conferences by de-emphasizing the role of applications.

## Data Processing April Exposition Slated in Florida

ORLANDO, Fla. — New developments and applications in the computer, data processing, and business equipment industries will be exhibited at the Southern Data Processing and Business Expo 2 here April 11-12.

Hardware and software companies have been invited to exhibit their latest equipment and uses of computer systems.

Representatives from the computer services field also will participate. Systems are offered by these firms in such areas as medical information, reservations, airline information, brokerage operations, cargo handling, and automatic checkout.

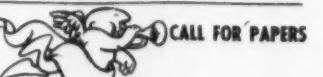
Seminars will be presented concurrently with the show, sponsored by the Central Florida Data Processing Management Association, according to Beryl E. Cording, seminar chairman.

"An effort will be made to include in the seminars presentations of the types of information that would benefit not only professional data processing personnel, but levels of management that are influenced by data processing operations," Cording, assistant manager of financial operations, Orlando Utilities Commission, explained.

Seminars during the two-day event will include sessions on feasibility studies; selection, hiring, and training of programmers and operators; management projects; budgetary cost forecasting; real-time; computer languages; and the latest hardware and software releases.

A banquet will be held the evening preceding the show opening at the Statler Hilton Inn.

Hours for the exposition will be 10 a.m. to 5 p.m. both days.



Aug. 24-25, San Francisco — ACM Symposium on Programming Languages Definition. Appropriate topics include, but are not limited to, models of language definition, correctness, termination or equivalence of algorithms, user defined extensions to language skeletons, automatic program verification, and automatic detection of program parallelism.

Deadline for papers is April 30. Contact: Dr. James A. Painter, IBM Corp., Dept. 978, Bldg. 025, Monterey and Cottle Rd., San Jose, Calif. 95114.

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**Program Optimization** DOCUMATIC produces output in a manner similar to the RPG compiler, pointing the way to program modifications which will provide faster throughput and smaller program size.

**Run Book** Machine operators are using DOCUMATIC output as the basis of their run book; a run book that gets away from scraps of paper and an operator's memory.

**Conversion Aid** DOCUMATIC gives you an English language description of the program with the RPG terminology removed. A programmer with no knowledge of RPG can convert the program to COBOL or PL/I.

**Training Aid** DOCUMATIC is assisting junior programmers with their first programs by giving them an English language description of what they have written, making it easier to learn the RPG language and to become productive faster.

**Communication with non-DP Types** DOCUMATIC provides a way for management to see your programs in simple English with only the basic data processing terms (input, file, etc.).

**Audit of Programs** Because DOCUMATIC eliminates the jargon associated with RPG, financial management can audit programs with no knowledge of the language.

**Updating Less Error Prone** DOCUMATIC output is significantly more readable than the RPG listing. For example, reasons (IF TAX IS BLANK ON INPUT) rather than indicator numbers are used whenever possible.

**Updating Take Less Time** Because the documentation is in English, because the documentation is uniform, because the documentation is accurate, DOCUMATIC can substantially reduce the time required for program maintenance.

**Accurate Documentation** Documentation produced by the programmer from original specifications, or before the program is completed, does not usually correspond to the final product. Because DOCUMATIC takes the information from the program itself, your documentation is accurate as well as current.

**Standardized Documentation** With manual methods, it often becomes necessary to decipher the documentation after it is written. DOCUMATIC provides a uniform method of documentation.

**Encourages Standards** Because DOCUMATIC produces documentation in a standard format, it encourages programming uniformity of record layouts, data names, modular calc specifications, etc.

**Total Program Documentation** DOCUMATIC produces a complete source program description... in minutes... no part of the program is left out.

## Technical and Elementary Approaches Are Authors' Main Concern for 'Introductions'

By William M. Waite  
CW Contributing Editor

A scholar is a person whose interest in a subject leads him to explore it in depth; to understand why his tools work, not merely how to use them.

No age or experience qualifications are needed for such scholarship. The enthusiastic teenager is often more scholarly than the venerable professor in the university.

Much of the information gleaned by a scholar would be deemed useless by those interested only in production, but it is of vital importance to the scholar himself.

In any field, both scholars and producers are needed. This should not be construed as an assertion that scholars do not produce, but rather that their emphasis is not on constant production.

### Need for Programmers

The computer business has its designers and its coders, just as any other area has innovators and technicians. We need people who can be given a specification and told to come back in a week's time with a program which meets that specification.

We also need those who can dream in their offices with their feet on the desk and come up with the basic ideas that drive the industry forward.

The two books under review are companions which will guide the first steps of the budding computer scholar. Both make

few assumptions as to the sophistication of their audience, and each is written for the person who is interested in knowing why.

Neither is suitable for the man who regards computing as a way of making money between 9 a.m. and 5 p.m.

### Sam — An Example

Let me postulate a person named Sam, age unspecified, who has been captivated by the machine. Sam has had some introduction to a computer when he wrote one or more programs in a high-level language.

To him, the machine was a table on which he placed his cards and a pigeonhole in which his printout was returned, or perhaps a Teletype which served both functions. Although his programs did run (finally), Sam has the opinion that this is a heck of a way to run a railroad.

### Basic Approach

Being a thoughtful, scholarly type, Sam decides that the first thing he ought to do is to find out what he is *really* dealing with. "Introduction to Digital Computers" will give him this information. After a brief overview of computer organization, the authors describe the basic physics of the transistor.

Their picture is concise, and appeals to intuition rather than mathematical or physical rigor. A discussion of computer cir-

cuits follows, in which the logic building blocks which make up modern machines are developed.

For the remainder of the book, the authors use only these logic blocks; they do not revert to circuits involving transistors again. This approach is consistent with current trends in the industry.

Chapter 4 develops Boolean algebra as a technique for describing the interconnection of logic blocks, while Chapter 5 discusses procedures for simplifying combinational circuits (*i.e.*, circuits whose outputs do not depend on past history).

Chapters 6 through 9 complete the basic parts of a computer with descriptions of storage and timing circuits, binary arithmetic and the arithmetic unit, and core memory. The remainder of the book explains how the parts are interconnected and how they are instructed to perform useful work.

### Workmanlike Coverage

The coverage of these topics is workmanlike, and Sam will finish up with a pretty fair idea of what is behind his Teletype or delivery window.

At this point, Sam's attitude will probably have changed to one of awe. "How can they possibly do it?" he wonders, when thinking about the high-level language he used to work with.

### Machine Language Slant

The second book, "Introduction to Computer Programming and Coding," will start him on the road to the answer. Chapters 1 through 5 cover the material given in the latter part of "Introduction to Digital Computers," but provide a somewhat different viewpoint. An excellent discussion of programming procedures and documentation is given in Chapter 6, and the remainder of the book is devoted to a number of different techniques and specific problems. In all cases, the coding is

TITLE	<i>Introduction to Digital Computers</i>	<i>Introduction to Computer Programming and Coding</i>
AUTHOR	G.A. Maley and M.F. Hellwege	F.K. Walnut
NO. OF PAGES	221	429
PRICE	\$9.00	\$17.30
PUBLISHER	Prentice Hall	Prentice Hall
FORMAT USED	Textbook	Textbook
INDEX	Yes (3 pages)	Yes (5 pages)
PROBLEMS USED	Problems at end of each chapter; no answers	Questions and answers
RECOMMENDED FOR READERS' BACKGROUND	Computer technicians	Scientific and commercial fields
PRESUMED TYPE COMPUTER DESCRIBED	Arithmetic processes at college level	No special math background; no previous computer knowledge
COVERAGE OF:	Primarily fixed-word binary	Fixed-word binary; variable-word decimal
Machine Logic	Yes	Briefly
Machine Language	Yes	Yes
Micro-programming	Yes, but not by that name	No
Assemblers	Briefly	Yes
Diagnostic Techniques	No	Yes
Operating Systems	No	No
Program Efficiencies	Yes	Yes
COMPUTER USES	None specifically	Many basic uses, which would normally be used as subroutines
WHAT DANGERS OF COMPUTERS COVERED	None	None
COMPUTER SELECTION	Both books deal with generic classes of machines rather than with specific computers.	

## book reviews

### Review at a Glance

TITLE	<i>Introduction to Digital Computers</i>	<i>Introduction to Computer Programming and Coding</i>
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done at the machine language level.

### Misdirected Approach

I believe that the most serious flaw in both of these books is the fact that the authors did not appreciate their audience. They seem to have the erroneous idea that they are writing for the 9-to-5 coders. This surely cannot be!

In this day and age, only a tiny minority of those people are allowed to write in machine language. By definition, a 9-to-5 coder is not likely to be interested in learning for its own sake. Since machine code will not improve his pay scale, why should he bother to read about it?

### Bibliography Wanted

No, gentlemen, your audience is made up of scholars who have

just discovered the computer — people who realize that they will seldom write in machine code, but who want to know why things work the way they do.

These people will want extensive bibliographies; references to satisfy their insatiable desire to pursue knowledge. Unfortunately, they will not find a single one in either of these two books.

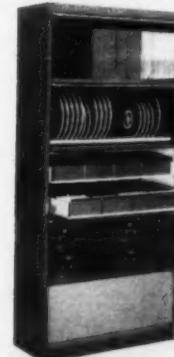
### High School Library

In summary, I would recommend the acquisition of these two books by any high school library, and by people who are interested in what goes on inside the enigmatic cabinets in the computer room or at the other end of the telephone line.

Any person who is concerned primarily with getting his problems out the door may as well save his money.

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## Classroom Computer Set Available

BIG SPRING, Texas — A classroom computer, complete with software and instructional materials, is being offered to schools for \$500 on a six-week trial.

The arrangement, being offered by DataMate Computer Systems, Inc., includes up to 20 hours of instruction and training and all

classroom materials, the firm said.

The computer is an ECP-18 with an elevated display panel and easy-to-learn instruction set, and is designed for student hands-on use in the classroom, the company said.

The \$500 may be applied toward the purchase price.



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## Inquiry System Released For IBM 360, 1401, RCA 70

ROCKVILLE, Md. — A card-oriented, tape-file resident, general-purpose file retrieval and report generator has been released by Management Sciences Systems.

Available for the IBM S/360 under DOS or OS, the Spectra 70 under TOS, and the IBM 1401; Easytrieve extracts information from magnetic tape files and generates reports in standard or user-defined formats. The S/360 version and the Spectra version both require 32K partitions, and the 1401 version requires 16K.

The program also has special

capabilities for accounting and statistical reporting, mailing label generation, and data file editing, the company said.

Report requests are written in an English-like control language incorporating the logical operators (AND, OR, XOR) the arithmetic operators (EQUALS, NOTEQUAL, LESS THAN, etc.) and the LIST verb for the user-defined report formats.

The system works only with fixed-format, fixed-length records, accepts its control input from cards, and can generate up to 25 reports from a single pass of the master file. The multi-report capability is supported by stripping the desired records into a scratch-tape during the initial pass, a company spokesman stated.

The Spectra and S/360 versions are written in Assembly Language, and the 1401 version is written in Autocoder. The program has been installed on four sites already, one of which is the Justice Department.

The program leases for \$4800 a year, and includes installation, training, user's manuals, and a maintenance warranty.

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## DEC Announces Programming Aid With Graphics Capability

MAYNARD, Mass. — Digital Equipment has announced the first software system for its Model 339 programmed buffer display that runs on the medium-scale PDP/9 computer.

The software is interactive, and eliminates the direct hardware manipulation which has been necessary with the device up to now, the company said. It also simplifies the assembly and compilation of programs, giving the user extensive graphics capability.

**339 Details**

The 339 is a CRT device designed as an option on the 18-bit PDP/9. The display operates from file commands generated from the PDP/9, and can convert digital data into tabular form, draw graphs, vectors, or characters. The system can expand or contract the picture size and respond to external commands, all under control of the new software package.

**Four Part Package**

The system consists of a Fortran compiler, a Macro assembler, a text editor, and the tracking package for the light pen. The compiler permits full communication between the user and the display system, and includes subroutines for line-drawing, textual display, and image-blinking.

The software permits the user to generate desired graphic sub-

files for production of pictures, display and alteration of images, and creation of image systems.

**Assembler Modified**

A series of modifications to the Macro-9 assembler provides the full capability of the device under assembly language pro-

gramming control, the company indicates.

The text editor is designed to facilitate program debugging and correction, permitting the user to display only that portion of the program which requires changing and alter it directly on the screen.



DEC programmer uses light pen to correct the contents of a displayed program. The preparation and debugging of a program is one of the possible functions of the DEC Model 339 CRT terminal with the new graphic support package.

## Conversational Cobol for S/360 Supports Any File

PARK FOREST, Ill. — A Cobol compiler which provides for conversational object programs and operates under the Disk Operating System for the IBM S/360 has been released by Martenson Associates.

**Supports Any File Type**

The package runs on Model 40s, with a minimum of 128K, and uses the standard DOS Basic Telecommunications Access Method as its monitor. The package will support any existing file organization, the company said. The system also provides for the support and administration of remote terminals such as the IBM 2260 and 2740.

In providing the opportunity for users to establish file inquiry systems, data base update and management systems, on-line update, and other remote-terminal oriented functions while still in the normal Cobol environment, the system runs in a real-time environment.

The terminals are treated as

any other I/O device within Cobol, making the programming very simple, the company stated. The conversational mode of operation applies only to the execution of the programs, not to their compilation.

**Up to 64 Terminals**

The package is called Real-Time Cobol, and can support up to 64 terminals with no difficulty, according to company president Herbert Martenson. Response times fall in the two-to-five second range with the program function mixes, that are used for testing, showing response time of about four seconds, he added.

The program is an adaptation of an IBM Type-III program called Faster, with the added provision of the Cobol interface.

The purchase price for the system is \$3250 plus installation, and it can be leased for \$200 per month, of which \$100 applies toward purchase, Martenson said.

## Business Time-Sharing in Fortran

DENVER, Colo. — A "complete, small, business-oriented" time-sharing package written in Fortran IV has been released by Computing Corp. of America.

The package "provides the time-sharing use with all of the commonly required business application software," the company states. The programs include inventory control, customer accounts, accounts receivable, accounts payable, payroll, general ledger, and profit/loss statement.

The programs are written in Fortran IV, and the company

will tailor programs to the customer's needs. These programs can be installed on any system with the Fortran IV capability.

Complete documentation is provided, including a user's manual designed for users with no knowledge of computer operation, the company pointed out. It further claims that the system is economical for firms with between 10 and 200 employees.

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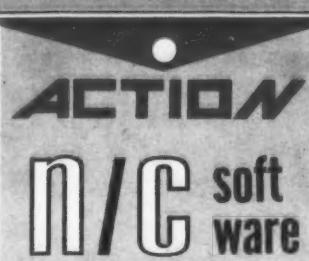
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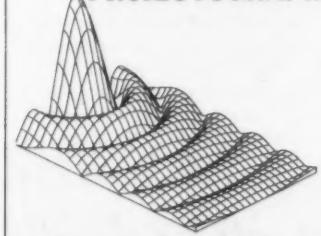
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Section Page 18

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Earnings 2,729,342	1,491,871
Shr Ernd .81	.44

a1967 a1968

Revenue \$374,019	\$1,028,159
bEarnings (14,470)	37,668
cShr Ernd (.02)	.05

a—Unaudited. b—Includes loss carry-forward. c—Based on average shares outstanding.

### COMPUTER ENVIRONMENTS CORP.

Year Ended Oct. 31

1967	1968
Revenue \$715,157	\$1,045,119
Earnings 42,197	74,950
Shr Ernd .13	.21

a1967 a1968

Revenue \$22,187,237	\$25,066,880
Earnings 990,694	1,170,762
Shr Ernd .23	.27

a—Based on average shares outstanding.
--

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Year Ended Dec. 31

1967	1968
Revenue \$16,608,272	\$20,000,000
bEarnings 1,165,389	1,627,000
Shr Ernd .91	1.27

a—Unaudited. b—Includes tax credit.

### RANDOLPH COMPUTER CORP.

Year Ended Dec. 31

1967	1968
Revenue \$15,584,000	\$30,976,000
Earnings 1,820,000	3,950,000
Shr Ernd 1.38	1.82

a1967 a1968

Revenue \$11,355,000 \$18,584,000

Earnings 8,871,000 13,140,000

Shr Ernd 1.56 2.05

a—Revenues from information, services, and leasing activities. b—Based on services, leasing, and insurance activities. c—Based on final net income assuming stock conversion of series B preferred.

### LEASCO DATA PROCESSING

3 Months Ended Dec. 31

1967	1968
Revenue \$1,355,000	\$18,584,000
bEarnings 8,871,000	13,140,000
cShr Ernd 1.56	2.05

a—Revenues from information, services, and leasing activities. b—Based on services, leasing, and insurance activities. c—Based on final net income assuming stock conversion of series B preferred.

## IBM 705 Model II UNIVAC II For Sale By Gov't.

The 705 is located at the Naval Construction Battalion Center, Fort Huachuca, Calif. and can be inspected weekdays beginning February 14. This system is being offered by the Defense Surplus Sales Office, San Diego, Calif. Sealed bids will be accepted up to 10 a.m., March 6, 1969.

The UNIVAC is located at the Electronics Supply Office, Data Processing Operations Branch, Bldg. 3400, Great Lakes, Ill. and can be inspected weekdays beginning February 19. This system is being offered by the Defense Surplus Sales Office, Columbus, Ohio. Sealed bids will be accepted up to 10 a.m. March 12, 1969.

You do not have to be present to bid, however, you are encouraged to inspect these systems before bidding.

Sales catalogs or further information can be obtained, without cost, by writing or calling:

### Defense Surplus Sales Offices

Dept SA-9-2  
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San Diego, Calif. 92132  
Phone 714, 235-3691  
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Columbus, Ohio 43213  
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EDP Manager

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JJC.  
Tom - better look into this

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## Levin-Townsend Cancels Stock Offer Plan for INA

NEW YORK — Levin-Townsend Computer Corp. is canceling its two-week-old plan to offer \$1.4 billion in securities for INA Corp., a Philadelphia-based insurance company.

Levin-Townsend President Howard S. Levin indicated the company had dropped the plan because of the continuing op-

position of INA management which could block a successful pooling-of-interests transaction.

Levin also indicated that the proposed transaction was delaying financing for other Levin-Townsend activities. He believed, however, that the plan had substantial support in investment circles.

## OTC Quotes Are Now Automated

NEW YORK — An automated system providing over-the-counter quotations is now in operation, according to the National Security Traders Association.

The STAQ (Security Traders Automated Quotations) system initially will quote 1100 heavily traded over-the-counter securities with more to be added later.

The system will work through some 30,000 interrogation ter-

minals manufactured by Bunker-Ramo Corp., Scantlin Electronics, and Ultronics Inc. that are currently used in brokerage offices throughout the country.

The association said that more than 100 houses that make a market in the stocks will feed bid-and-ask quotations into the system's computers.

The quotations will be revised at least hourly during the day.

## Leasco, Chemical Bank Talks Indicate No Negotiations Now

NEW YORK — Leasco Data Processing Equipment Corp. officials have met with officials of the Chemical Bank New York Trust Co., Leasco Chairman Saul P. Steinberg admitted at Leasco's annual meeting.

Steinberg said the meeting had been with William S. Renchard, chairman of the Chemical Bank, and other bank officials. According to informed sources, Leasco has been buying shares of Chemical Bank, which has almost \$9 billion in assets and is the sixth largest commercial bank in the U.S.

Renchard confirmed he had met with Steinberg, but Renchard stressed that there are "absolutely no negotiations in progress."

### Looking for a Bank

Steinberg did say Leasco is considering bringing its "capabilities and assets together with a large bank," but "at the present time we've made no decision about seeking any specific bank."

Chemical Bank did say that it signed a previously announced agreement to purchase Realtime Systems Inc., a time-sharing computer operations subsidiary

of Levin-Townsend.

The move was seen as serving to blunt merger overtures to Chemical Bank from Leasco. The acquisition of Realtime is thought to possibly put antitrust roadblocks in the way of a Leasco-Chemical Bank merger, which the bank opposes.

Steinberg also told the annual meeting that Leasco is looking at several banks and now has a portfolio of \$25 million in stock of other companies.

As to why Leasco wants to acquire a bank, Steinberg said that service industries such as banks "are at a premium in our post-industrial society." He also indicated that Leasco could use a banking subsidiary to market other information services possibly involving computers.

As far as Leasco is concerned, the "buying and selling of funds by a bank would be incidental to" its service functions, Steinberg said.

Steinberg told the Feb. 11 meeting that Leasco will continue to separate operating earnings from capital gains in reporting income in the future. In the first quarter, for example, \$5 mil-

lion of the \$13.1 million earnings was described as gain from investments.

### Listing Change Sought

The executive also said Leasco is taking steps to have its common stock listed on the New York Stock Exchange. Leasco is currently listed on the American Stock Exchange.

The computer services group of Leasco is generating about \$4 million in revenues each month, Steinberg said. "We are convinced that software services will constitute one of the greatest growth opportunities in the coming decade," he added. He also said that he believes industry spending in the next six years would divide into 30% for hardware and operating expense and 70% for software.

Shareholders approved increasing authorized common shares to 50 million from the current 12 million and an increase in authorized preferred to 25 million from the current 6 million which paves the way for a 5-for-2 split of common previously proposed to be distributed March 10.

## DPF&G and Avnet Explore Possibilities of Marriage

NEW YORK — Data Processing Financial & General Corp. and Avnet, Inc. have held exploratory merger talks, according to company officials.

Harvey Goodman, president of DPF&G, and Morton D. Weiner, president of Avnet, said the talks were "very preliminary."

DPF&G has bid unsuccessfully in the past year for Railway Express Agency Inc., Great Atlantic & Pacific Tea Co., and has considered and rejected entry into the competition to take

over Warner Bros.-Seven Arts.

In the year ended last June 30, Avnet earned \$18 million, or \$1.24 a common share on a fully diluted basis, on sales of \$232.7 million.

DPF&G earned \$3.8 million, or \$1.22 a share, in the year ended last May 31 on revenue of \$17.4 million.

Goodman said that analysts' estimates of earnings of \$2.50 a share on revenue exceeding \$35 million in fiscal 1969 were "pretty much in the ball park."

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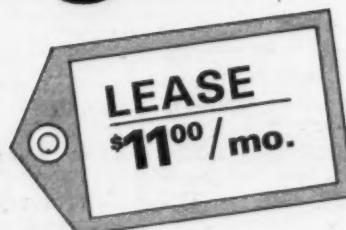
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## COMPUTER STOCKS: TRADING SUMMARY

Week Ended Feb. 14, 1969

EXCHANGE	BASE PRICE 3-1-68	CLOSING 1968-69	RANGE	PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	253-157	240		* Burroughs	+ 2 3/4	+ 1.16	+ 46.90
NYSE	67 3/4	110-54	62 1/8		Collins Radio	+ 1/8	+ 0.20	- 8.30
NYSE	101 1/2	174-94	135		* Control Data	- 4 1/4	- 3.05	+ 33.00
AMSE	102	177-95	161 1/4		* Digital Equipment	- 1/4	- 0.15	+ 58.09
NYSE	19 1/8	27-18	22 1/4		Electronic Assoc.	- 1	- 4.30	+ 16.34
NYSE	87 1/4	100-81	92 5/8		General Electric	+ 1 7/8	+ 2.07	+ 6.16
NYSE	60	91-59	77 1/8		Hewlett-Packard	- 2 1/8	- 2.68	+ 28.54
NYSE	93 1/8	144-89	121 5/8		* Honeywell	+ 1 5/8	+ 1.35	+ 30.60
NYSE	288 1/2	375-280	308 3/4		* IBM	+ 11 1/2	+ 3.87	+ 7.02
NYSE	103 7/8	153-40	119 1/4		* NCR	+ 5	+ 4.38	+ 14.80
NYSE	46 7/8	53-44	43 3/4		RCA	- 1/4	- 0.57	- 6.67
NYSE	39 1/8	53-44	44 3/8		Raytheon	- 5/8	- 1.39	+ 13.42
OTC	22 1/2	66-20	36 1/2		* Sci. Control Corp.	+ 1/2	+ 1.39	+ 62.22
NYSE	78 3/4	114-72	114		* Scientific Data	+ 19 1/4	+ 20.32	+ 44.76
NYSE	45	63-42	52 1/2		* Sperry Rand	- 1	- 1.87	+ 16.67
AMSE	22 1/2	39-20	29 1/4		* Systems Eng. Labs	+ 2 1/4	+ 8.33	+ 30.00
EXCHANGE	BASE PRICE 3-1-68	CLOSING 1968-69	RANGE	PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	58 3/8	91-52	75 3/8		Addressograph-Multigraph	+ 5 1/2	+ 7.87	+ 29.12
OTC	21	85-42	57		Alphanumeric	- 1 1/2	- 2.56	+ 171.43
NYSE	29	41-26	36 7/8		Ampex	- 5/8	- 1.67	+ 27.16
OTC	17 1/4	27-14	18 1/2		Bolt, Beranek & Newman	+ 1/4	+ 1.37	+ 7.25
NYSE	13 1/2	27-14	15 3/8		Bunker-Ramo	- 1/2	- 3.15	+ 13.89
AMSE	32 1/8	50-27	36 1/4		CalComp	+ 1 1/2	+ 4.32	+ 12.84
OTC	24 1/2	49-20	32		Cognitronics	- 1 1/2	- 4.48	+ 30.61
OTC	12	18-10	14 3/4		Computer Equipment	- 1/8	- 0.84	+ 22.92
AMSE	15 1/4	25-13	21 3/8		Data Products	- 2 1/8	- 9.04	+ 40.16
OTC	19 1/4	27-16	20 1/4		Digitronics	- 1/2	- 2.41	+ 5.19
OTC	39	67-32	57 1/2		Electronic Memories	+ 2	+ 3.60	+ 47.44
OTC	10	29-9	11 7/8		Fabri-Tek	+ 1/4	+ 2.15	+ 18.75
OTC	20 5/8	65-16	38 1/4		Farrington Mfg.	+ 2 1/2	+ 6.99	+ 85.45
OTC	12 1/2	26-10	18		Information Displays	- 1/2	- 2.70	+ 44.00
AMSE	16 7/8	52-14	29 3/4		Milgo Electronics	- 2 1/2	- 7.75	+ 76.30
AMSE	57 1/2	108-54	65		Mohawk Data Sciences	+ 1 7/8	+ 2.97	+ 13.04
OTC	74	145-71	113		Optical Scanning Corp.	+ 5	+ 4.63	+ 52.70
OTC	18	42-16	26		Photon	- 3/4	- 2.80	+ 44.44
AMSE	25 5/8	38-12	35		Potter Instrument	- 5	- 6.76	+ 71.43
OTC	40 1/4	99-38	69		Recognition Equipment	- 1/4	- 1.12	+ 37.50
AMSE	16	29-14	22		Rixon Electronics	+ 1/8	+ 0.21	+ 29.81
NYSE	46 1/8	66-42	59 7/8		Sanders	+ 3	+ 4.17	+ 59.57
OTC	47	155-53	75		Scan-Data	- 2	- 6.06	+ 23.46
OTC	40 1/2	51-32	31		Tally Corp.	+ 3/4	+ 0.28	+ 10.84
NYSE	242 1/4	321-229	268 1/2		Xerox			
EXCHANGE	BASE PRICE 3-1-68	CLOSING 1968-69	RANGE	PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	48 1/2	64-37	42 1/2		* Acme Visible	- 1/2	- 1.16	- 12.37
NYSE	20 1/2	32-18	20 1/2		Adams-Mills	-	-	
OTC	13 5/8	29-13	26		Baltimore Business Forms	-	-	+ 90.83
AMSE	27	44-21	26 1/2		* Barry Wright	+ 3/4	+ 2.91	- 1.85
OTC	31 1/4	42-26	44 1/4		Data Documents	+ 1/4	+ 0.57	+ 41.60
OTC	27 1/4	44-26	41 1/4		Ennis Business Forms	+ 1/4	+ 0.61	+ 51.38
NYSE	84 1/8	119-81	72 1/2		* 3M Company	+ 4 3/8	+ 6.42	+ 25.00
NYSE	58	93-48	101 1/8		Memorex	+ 1 3/8	+ 1.38	+ 20.21
OTC	27 1/4	33-25	31		Moore Business Forms	- 1 3/4	- 5.34	+ 13.76
NYSE	57 1/4	49-24	41 3/8		Nashua Corp	- 3 1/2	- 7.80	- 27.73
OTC	31 1/4	56-40	45		Reynolds & Reynolds	-	-	+ 44.00
OTC	34 1/2	35-24	29 1/4		Standard Register	-	-	- 15.22
NYSE	37 3/4	44-30	31		Varco	- 1	- 3.13	- 17.88
AMSE	14 1/4	23-13	18 3/8		Wabash Magnetics	+ 1/2	+ 2.80	+ 28.95
OTC	25 3/4	37-24	32 1/4		Wallace Business Forms	+ 2 3/4	+ 9.32	+ 25.24
EXCHANGE	BASE PRICE 3-1-68	CLOSING 1968-69	RANGE	PRICE	SOFTWARE & EDP SERVICES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	7 1/2	26-7	12 1/2		Advanced Computer Techniques	+ 1 1/4	+ 11.11	+ 66.67
OTC	17	36-14	36 1/2		* Applied Data Research	+ 1 1/2	+ 4.29	+ 114.71
OTC	15 1/2	23-13	16		* Aries	-	-	+ 3.23
AMSE	47	75-42	75 3/4		Automatic Data Processing	+ 3 1/2	+ 4.84	+ 61.17
OTC	4	19-4	12 1/2		Automation Sciences	+ 3/4	+ 6.38	+ 212.50
OTC	4 1/2	23-3	17 1/4		* Brandon Applied Systems	+ 1/4	+ 1.47	+ 283.33
AMSE	22 7/8	43-19	19 1/8		Computer Applications	+ 1/2	+ 2.68	- 16.39
OTC	5	15-7	16 1/2		Computer Environments	+ 4 1/2	+ 37.50	+ 230.00
OTC	30	64-24	47		Computer Network	-	-	+ 56.67
OTC	39	62-28	40		* Computer Sciences	- 4 7/8	- 7.80	+ 44.05
AMSE	36 1/2	90-36	85 1/4		* Computer Usage	+ 4	+ 11.11	+ 2.56
OTC	12 1/2	26-5	23		* Computing & Software	- 4 3/4	- 5.28	+ 133.56
OTC	14 1/2	22-10	14		Datamation Services	+ 1/2	+ 2.22	+ 84.00
OTC	12 1/2	20-9	15		Datab	-	-	- 3.45
AMSE	38 3/8	52-26	36 1/4		* Digitel	+ 1	+ 7.14	+ 20.00
OTC	17 1/2	34-16	25		Electronic Computer Prog. Inst.	+ 2 1/8	+ 6.23	+ 5.54
OTC	21	28-4	15		* Informatics	+ 1/4	+ 1.01	+ 42.86
OTC	5	28-4	17 1/2		Matrix Corp.	- 1/4	- 1.64	- 28.57
AMSE	31	61-28	29 1/8		* National Computer Analysts	+ 2 1/2	+ 16.67	+ 250.00
OTC	41 1/4	415-10	10		Planning Research	+ 1/8	+ 0.43	+ 6.05
OTC	9	15-8	7 1/2		Programming & Systems	- 1/2	- 4.76	- 24.53
OTC	429 1/2	444-8	29		Software Systems	-	-	+ 16.67
OTC	20 1/2	22-10	14 1/2		Strategic Systems	- 1	- 3.33	- 1.69
OTC	412	412-10	10 1/4		TBS Computing Centers, Inc.	+ 1/4	+ 1.75	- 29.27
OTC	63	182-57	128		United Data Centers	+ 1 1/4	+ 13.89	- 14.58
OTC	420	36-20	37 1/2		* University Computing	- 15	- 10.49	+ 103.17
OTC	430	30-19	17 1/2		URS Systems Corp.	- 1	- 2.60	+ 87.50
					U.S. Time-Sharing	+ 1/2	+ 2.94	+ 41.67
EXCHANGE	BASE PRICE 3-1-68	CLOSING 1968-69	RANGE	PRICE	LEASING COMPANIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	18	57-18	44 1/2		Bothe Computer	-	-	+ 147.22
OTC	4	24-4	16 1/2		Computer Exchange	+ 1/2	+ 3.13	+ 288.24
AMSE	25 1/8	36-20	30 5/8		* Computer Leasing	- 2 7/8	- 8.58	+ 21.89
OTC	15 1/8	15-9	13		Continental Computer	+ 1	+ 8.33	- 15.45
OTC	12 1/8	19-10	11		* Cyber-Tronics	-	-	- 10.20
AMSE	106 5/8	184-50	55 7/8		Data Proc. Financial & General	+ 4 3/8	+ 8.50	- 47.60
OTC	25 5/8	34-12	13 1/2		Datronic Rental	+ 1	+ 8.00	- 46.00
OTC	30 5/8	61-18	55 1/2		Dearborn Computer	+ 3	+ 5.71	+ 177.50
OTC	13 5/8	20-11	12 1/2		DPA, Inc.	-	-	+ 5.66
AMSE	28 1/8	69-35	38 5/8		Greyhound Computer	- 1 1/8	- 2.83	+ 37.33
AMSE	28 3/4	40-25	25 7/8		Granite Equipment Leasing	-	-	- 10.00
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**Computer-Carrying Company Covers 12 Northeast States**

NEW YORK — Strategic Data Transport, a subsidiary of the multi-faceted Strategic Systems, Inc., a New York software company, succeeded the half-century old S. Santini Storage Corp. last year and is now providing hauling service to computer hardware owners in 12 northeastern states.

Strategic Data Transport has a fleet of vans especially fitted out to move computers and allied equipment. Special equipment is used to ease machines into place and hold them safely during the journey.

Among these devices are, hydraulic jacks on wheels which can maneuver bulky objects up to 30 ft. long and weighing up to 10,000 lbs.; magnesium ramps and floor plates which provide safe ground-to-van handling of large pieces of EDP equipment; 4000-lb. capacity power tail gates that have special safety rails to prevent rolling while loading and a cargo control system of nylon strapping and horizontal steel tracks to hold machinery securely in transit.

Computer Solutions Joins AL/COM Time-Share

EAST ORANGE, N.J. — Computer Solutions, Inc. has become a member of Applied Logic Corp.'s AL/COM network of time-sharing associates.

As a member of the AL/COM network, Computer Solutions becomes a local distributor of computer power generated at Applied Logic's Princeton, N.J. headquarters. Local customers and distributors feed into this power grid through the use of normal telephone lines.

In addition to time-sharing, the new member offers data services, specialized computer hardware, consulting, peripheral equipment and supplies, and engages in research and development.

Neff Elected to Board

DALLAS — John C. Neff, a

Nashville, Tenn., investment counselor, has been elected to the board of directors of Scientific Control Corp., a Dallas-based computer manufacturer.

In July of 1968, Mr. Neff, in association with Jack C. Massey who is board chairman of Kentucky Fried Chicken, organized Capital Investment Services and the investment counseling firm of John C. Neff & Associates of Nashville.

**Low Cost Terminal to Be Offered by IMLAC Corp.**

WATERTOWN, Mass. — A low-cost, single-station computer display terminal will be the first major product of IMLAC Corp., new manufacturer of computer oriented products located in Watertown.

The terminal will be compatible with any programming language, can be tailored to any communications software procedures, and will accept any transmission rate, yet it will be competitively priced according to the company.

The new corporation will offer broad-based professional information support to both business and government. Their services will include facility management, software development, turn-key systems contracting, as well as product development.

All of National Liberty Corp.'s computers and data processing activities, including its personnel, have been transferred to the new company in conjunction with a long-term facility management contract.

Heading up the new enterprise as president and chief executive officer is Carl G. Sempier, who was formerly with The Penn Central Co. in an executive capacity with responsibility for all information activities.

**National Liberty Corp. Launches Service Branch**

VALLEY FORGE, Pa. — National Liberty Corp. has announced entry into the information and computer marketplace with formation of the National Information Systems Corp.

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Walter F. Kane	Manager Computer Center	Computer Age Industries, Inc. Fairfax, Va.	Software Instruction	Computer Learning Corp. Norfolk, Va.
Henry J. Lee	Consultant	General Analytics Corp. New York	Consultant	The Diebold Group, Inc.
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J. Joseph Harrington	Manager Information Processing	Raytheon Co. Lexington, Mass.	Manager Administrative Systems	Boston College
James E. Still, Jr.	Vice-President	Butler Data Systems Hawthorne, Calif.	Director Support Services	Lockheed Aircraft Corp. Georgia

## Orders and Installations

The Academy of Computer Technology, Salt Lake City, Utah, has ordered a Univac 9200 computer system as a terminal unit to a Univac 1108 at the University of Utah.

The system will be used as a

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communicator system for students. Delivery is scheduled for March.

The First National Bank, DeKalb, Ill., has ordered a Burroughs B340 computer system to handle proof transit, demand deposit accounting, savings, and installment loans. Delivery is scheduled for August.

The Hamburger Flugzeugbau GMBH, Hamburg, West Germany, has installed a Control Data 3150 computer system to be used for general scientific programs for the aircraft industry, as well as performing aerodynamic programs and wing-tip vibration calculations.

Lenox Furniture Corp., Bladensburg, Md., has installed a Univac 9200 system for use in inventory control, payroll processing, and general accounting.

Scandinavian Airlines System in Copenhagen, Denmark, has installed a third Univac 494 system valued at \$2.5 million. The new system is in addition to 494s and 418-11s currently in use and will be employed primarily for processing administrative work.

Com-Share, Inc., Ann Arbor, Mich., has ordered four disk file systems with interfacing controllers from Bryant Computer Products, Walled Lake, Mich.

The system, at a cost in excess of \$1.4 million, will be interfaced with SDS-940 time sharing computer systems located in Norwood, N.J., and Ann Arbor for program storage.

Microdata Systems, Houston, Texas, has ordered a Univac 9200 system for delivery in February.

CENDAC Data Centre, Calgary, Canada, has ordered a second Sigma 7 computer system from Scientific Resources Corp. The system is an integrated hardware/software package which includes a central processor and is an addition to an existing system.

NEW YORK — AD/MAR RESEARCH CO. INC., a marketing firm, announced it had acquired AMERICAN COMPUTER INSTITUTE, INC., and its affiliate, HARVEY PRODUCTS CORP., INC., educational services. Terms of the transaction were not available.

WARMINSTER, Pa. — SYSTEMS TECHNOLOGY CORP., a systems consulting firm, announced it had merged with MANAGEMENT DATA CORP. of Philadelphia. Terms of the agreement were not disclosed. The company will undertake design and fabrication of measurement and control systems including computer-based systems.

MOUNTAIN VIEW, Calif. — A new corporation, DATA MEMORY, INC., has acquired MVR CORP. and will produce and market a full line of magnetic disk recording systems. Privately placed financing of \$2 million was provided through Atherton Investment Corp., Palo Alto, Calif. and Smith, Barney & Co., Inc., New York. Ray Stewart is president of the new company.

HUNTSVILLE, Ala. — INTERTECH RESEARCH SERVICES, INC. announced that it had completed acquisition of DATA PROCESSING SERVICES, INC., Chattanooga, Tenn.

SAN GABRIEL, Calif. — Hugh L. Clary, president of CLARY CORP., and Ronald M. Colitti, president of ACCURATE ELECTRONICS CORP., have terminated merger discussions.

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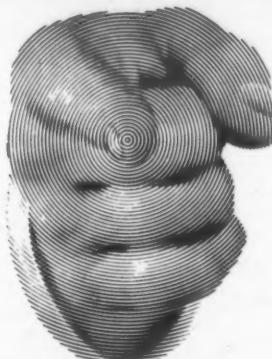


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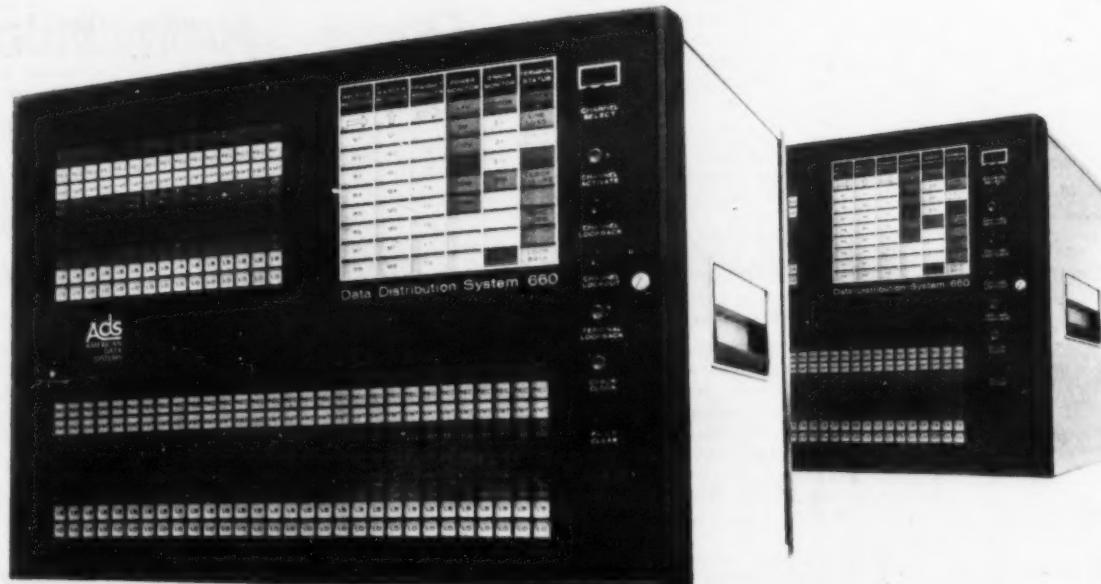
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